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AUTHOR Stanovich, Paula J.; Stanovich, Keith E.
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ABSTRACT

Students with the dual handicaps of hearing impairment and mental retardation display special problems in language acquisition. These problems do not appear to have been addressed by curricula that have been designed for either of the single handicap groups. Since specially designed curricula for this population are virtually nonexistent, a program that was developed to teach sign language to hearing impaired-mentally retarded students is described. The development of the program was based on a scientist/practitioner model of education. A rationale for the choice of a sign system (Signed English) is described. Teaching method suggestions, record keeping ideas, and sample teaching activities are discussed. Attention is drawn to the problem of family member involvement in programs of this type. (Author)

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Teaching Sign Language to Hearing Impaired-Mentally Retarded Students

Paula J. Stanovich

Hawthorne Learning Center

Keith E. Stanovich

Oakland University

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Abstract

Students with the dual handicaps of hearing impairment and mental retardation display special problems in language acquisition. These problems do not appear to have been addressed by curricula that have been designed for either of the single-handicap groups. Since specially designed curricula for this population are virtually nonexistent, a program that was developed to teach sign language to hearing impaired-mentally retarded students is described. The development of the program was based on a scientist/practitioner model of education. A rationale for the choice of sign system (Signed English) is described. Teaching method suggestions, record keeping ideas, and sample teaching activities are discussed. Attention is drawn to the problem of family member involvement in programs of this type.

Only recently has it been recognized that students with multiple handicaps need a curriculum designed specifically for them. Generally teachers of multiply handicapped pupils have had to improvise by patching together parts of various curricula designed for persons with a single handicap. Of course, due to the need for individualization, special education will always require some degree of material and curriculum adaptation. However, the job of the special education professional could be made easier if curricula designed specifically for the multiply handicapped population were generally available. In short, the teacher of multihandicapped students should realize that the presence of two or more handicapping conditions in combination creates special teaching problems. Many of the techniques which are successful in teaching single-handicap students will have to be adapted to be successful with this population. Others may have to be abandoned altogether.

One area particularly lacking in curriculum development is that of teaching sign language to persons who are both mentally retarded and hearing handicapped. There are some references on the subject of multiply handicapped deaf students (e.g., Berger, 1972; Campbell & Baldwin, 1982; Dibenedetto, 1976; Griffing, 1981; Hammond & Burns, 1976; Healey & Karp-Nortman, 1975; Nowell, 1980; Tweedie & Shroyer, 1982) but information specific to <u>teaching</u> HIMR students is sparse. Most of the aforementioned references deal with either defining or describing the population and outlining needed areas of study. Unfortunately, these areas still appear to need study. Furthermore, the literature on each of the single disabilities does not address the special problems that arise when the second disability is also present. Curricula designed for pupils with a hearing loss do not take into account the complications in language acquisition that may be exhibited as a result of mental retardation. Neither do curricula designed for mentally retarded students address problems that are encountered when working with hearing handicapped students. The situation is compounded by the fact that

the two disabilities are not additive, but instead have interactive effects on language acquisition (see Griffing, 1981 and Ross, 1976). In fact, according to Griffing (1981):

> when a deaf child has additional handicapping conditions present, each of them could interact upon the others to create a compounded educational need heretofore not recognized (p. 3)...The critical conditions in developing a useful definition of multihandicapped deaf include recognition that (a) a sensory deficit is the primary handicapping condition when one recognizes that use of the senses are absolutely required when learning; (b) the impact of a set of handicapping conditions is more a matter of degree than kind; and (c) the multiples of handicpping conditions in the child are significant in their compounded state ; that being multihandicapped is more than an additive or linear process (p. 5).

Multihandicapping conditions, therefore, have been established as presenting unique teaching problems. Additionally, it seems that when the conditions are those of mental retardation and hearing loss, even more difficult problems occur. Specifically,this combination causes much difficulty in language learning (Napierkowski 1981).

Though multihandicapped deaf students belong to a low-incidence population, it is not an insignificant one. Griffing dispels the notion that a special education teacher will be unlikely to have a student with multiple handicaps by stating that at least 40% of the enrollment within most programs for deaf children are multiply handicapped and he reiterates his earlier point by saying that they "...do not seem to be suitably served by the conventional curriculum and plan of instruction for deaf children (p. 4)." Dibenedetto (1976) gives support to Griffing's incidence statement when he says that there are three to four times as many hearing handicapped students among the mentally retarded population as among non-handicapped school students. Fristoe & Lloyd (1979) place the incidence of significant hearing loss among mentally retarded children at 10-15%. Thus we have identified a significant number of students whose

educational needs are not currently being met, especially in the area of language programming - the hearing impaired mentally retarded (HIMR) student. This, then, is the topic at hand, how to carry out language programming for the HIMR student.

In this paper we will describe a program that was developed to teach sign language to hearing impaired mentally retarded students and discuss critical issues that were raised during the development of the program. We will also present some instructional techniques and activities which should be useful to other teachers and which might possibly facilitate the development of a curriculum designed specifically to teach sign language to HIMR individuals. These techniques have been developed over a period of six years while working with students at Hawthorne Learning Center, a public school program for mentally handicapped students in Pontiac, Michigan. Since the project's inception a total of 5 HIMR students have been involved. The students, ages 11-24 were mildly to moderately mentally retarded and had hearing losses which ranged from mild to profound. Two students also had cerebral palsy, one was blind, and none were verbal communicators. All but one of these students wore amplification devices (hearing aids and/or auditory trainers), but even with the amplification response to verbal directions was poor. Additionally, one hearing student was added to the project who needed an alternative expressive communication system because he was essentially nonverbal. The students were placed in a classroom for severely multiply impaired (SXI) teens and young adults (9 students total) which was staffed with one teacher and two instructional aides. The teacher's educational background was in mental retardation and she had several years' experience working with multiply handicapped students with a wide variety of handicapping conditions. Additional program services included nursing, physical and occupational therapy, and speech and language therapy. The teacher had minimal familiarity with sign language when the project began (Signed English, 25-word vocabulary) and the rest of the staff had never used sign language or a sign

system of any kind.

When first beginning to work with students who are both mentally retarded and hearing handicapped and who do not as yet have an established communication system (i.e., are nonverbal), the first problem faced by the teacher is the choice of communication system. Speech is likely precluded as the primary source of communication for this group due to the presence of the dual handicaps, therefore an alternative mode of communication must be considered, but which one? The two most common forms of alternative communication systems from which the teacher may choose are a communication board and a sign language system. Each has its advantages and disadvantages. Fristoe and Lloyd (1979) characterize the former as static and aided and the latter as dynamic and unaided. The major disadvantage of aided systems as an alternative communication system is that the user must either remain near the board or carry it with her at all times, or she will be unable to communicate. Communication boards can also require inordinate amounts of time to make and are not easy to change when the student's vocabulary expands. Sign language circumvents these problems, but introduces others. For example, signers are dependent upon other people being fluent with their system and learning sign requires more manual dexterity than does the use of a communication board.

In making the system choice for the students it was felt that the unaided aspect of a sign system is very important for individuals who are already encumbered with equipment such as wheelchairs, walkers, crutches, and/or amplification devices. With an unaided system students are not required to remember to carry yet another piece of equipment nor are they dependent upon another person (teacher, aide, parent) to remember it for them. Thus, a point strongly supporting the choice of sign was that the system would always be with the student. Sign language had another important characteristic that made it the system of choice. The students' knowledge of sign language would connect them

with the community of deaf and hard of hearing persons, a close-knit community which could perhaps in future offer some vocational, social, and leisure opportunities to the students. Therefore, given these factors it was decided that a sign language system would be the best mode of communication for this group of HIMR students.

The next step in the decision process, once it was decided to use a sign language system as the alternative communication mode, was to determine which system would be best for the HIMR students. In choosing the system there were several considerations, some of which were student concerns and others which were teacher/parent concerns. An important consideration for the teacher is that the system be fairly easy to learn. With a class of nine students, each presenting a different mix of disabilities, it was felt that a large block of time could not be allocated to learn a sign language system for only one or two students because time also had to be allocated for developing alternative communication systems for the physically handicapped hearing students in the classroom (e.g., Blissymbolics communication boards, picture boards, technological devices, etc.). Therefore, a minimal amount of teacher learning time would be seen as a positive system attribute. The time needed to learn a sign system was also seen as a critical factor for achieving parental cooperation in communication efforts. According to Signorat and Watson (1981) few parents of HIMR children learn to use manual communication. Therefore, it was deemed necessary to keep the system as simple as possible in order to encourage parents to learn it.

The next problem to be addressed once the decision to use a sign system has been made is the choice of specific system. Utilizing a formally established system as opposed to one of our own devising (e.g., using ASL signs in English word order) appeared to be in the best interest of both the teacher and her students because the students would have a system which would be readily available were they to move out of their current classroom, not an idiosyncratic

one which might ultimately prove nontransferable. This point seemed particularly important since the primary goal for our students is increased independence. Having them use a system with which only a handful of people were familiar and for which there are not readily available materials would be self-defeating. Finally, using an established system would be a time saver for the teacher because she could order books and materials instead of making her own.

At this point several questions had to be considered:

a) what are the available systems?

b) what are the differences, advantages, disadvantages among the available systems?

c) what limitations does the teacher place on system choice?

d) what limitations do the students place on system choice?

Turning first to the question of available sign systems, we were aided immensely by the existence of some excellent reviews of this subject written by Fristoe and Lloyd, 1979;Wilbur, 1979; Wilbur, 1976). These are good resources for the teacher beginning study in this area. The first distinction of importance is the contrast between American Sign Language (ASL) and the pedagogical systems. ASL, though a true language (Bellugi & Klima, 1978; Fristoe & Lloyd, 1979; Wilbur, 1976), is syntactically different from English, whereas most of the other systems follow English word order. These systems are known as pedagogical systems because they have primarily been developed for use in classroom settings and are intended to facilitate the learning of English by deaf students, hence making it easier for them to use school materials. Examples of pedagogical systems include Lingustics of Visual English (Wampler, 1972), Seeing Essential English (Anthony, 1971), Signing Exact English (Gustafson, Pfetzing, & Zawolkow, 1975), and Signed English (Bornstein, Saulnier, & Hamilton, 1983; Bornstein et al, 1975; Bornstein, 1975).

The obvious first choice would seem to be American Sign Language, due to

the fact that it is the language of the majority of deaf persons in the U.S. and this link to the deaf community is an important one for our students. However, ASL did not appear to be suitable for this particular project for several reasons. First, because ASL is a true language which differs syntactically from spoken English it would require much time to learn and the help of a certified instructor. Second, given that the students were in a classroom which included hearing students it was felt that using a system based on English word order would encourage peer interaction. Third, in order for parents to learn ASL they would likely have to enroll in a formal course (a highly unlikely occurrence), whereas with a pedagogical system materials could be sent home with the student, thus encouraging parent participation. All three of these points turned out to be important as will be seen later in the paper.

With the elimination of ASL, then, the question became which of the pedagogical systems to use? Both Wilbur (1976) and Fristoe and Lloyd (1979) seem to recommend the use of Signed English with the HIMR population and after careful scrutiny, we concurred. Signed English (Bornstein, Saulnier, & Hamilton, 1983; Bornstein et al, 1975; Bornstein, 1973; Fant, 1964; O'Rourke, 1973; Watson, 1964) has several characteristics which made it our system of choice. It is based on ASL signs, follows English word order, utilizes a minimum of fingerspelling, and does not require that morphological markers be used in the early stages of language development. Also, in the development of Signed English new signs were created when necessary in order to simplify and streamline the system, all the while making it as close as possible to spoken English.

The evidence, therefore seemed to indicate that Signed English would be the most appropriate sign system for this group of students. Thus, having **decided on a specific sign language system the next step in the project was to develop a method for teaching this new means of communication to the students.** The Signed English dictionaries (Bornstein, Saulnier, & Hamilton, 1983; Bornstein

et al, 1975) proved to be very well designed for the purpose of teaching the staff the system, but references on teaching sign language to hearing impaired mentally retarded students appeared very sparse indeed. In fact, Dibenedetto (1976) found that there was a lack of research in this area and called for investigations into language, teaching techniques and methodology for working with HIMR students. A few articles on teaching sign language to mentally retarded hearing students have been published (e.g., an article on the influence of iconicity and phonological similarity on sign learning by Griffith and Robinson, 1980, but information on actually setting up a program for multiply handicapped students did not seem to exist. Even a well-developed resource list (Fristoe & Lloyd, 1977) of publications pertaining to manual communication with severely handicapped persons contained only a few references seemingly relevant to teaching a sign language system to HIMR students. Further investigation of these particular references did not prove fruitful. One major problem was that most did not progress beyond single-sign teaching. Additionally, none utilized Signed English nor answered questions about how to structure the teaching tasks, regardless of system choice.

Finally, two commercially available curricula purporting to contain a system for teaching sign to HIMR students were ordered (Peterson & Schoenmann, 1977; Hyde & Engle, 1977), but both were judged inappropriate for this population. One was developed for severely mentally handicapped students and did not contain much sign, and the other involved some proficiency at reading and used quite a bit of fingerspelling. Neither was based on Signed English. The project method, then, was primarily designed by the classroom staff with some input from speech and language therapists. We believe this project to be an excellent example of the teacher as experimenter within the science of education. Indeed, we worked from a scientist/practitioner model - theories were developed based on currently available research from related areas, variables were

manipulated, and the outcome was studied. In the program revision process theories were refined based on outcomes, then variables were manipulated again. Revision is an ongoing process.

After the system had been in use for almost two years, an article by Kriegsman, Gallaher, and Meyers (1982) was published that was relevant to several of our concerns. Their article discussed teaching sign to nonverbal hearing children, but is applicable to MIMR students. The first point the authors made was that the decision to implement a sign language program is a complex one (see also Fristoe & Lloyd, 1979) and should be made jointly by the team of persons involved with the student (school personnel and family) in order to be successful. They discussed the decision-making process this team should follow, prerequisite behaviors needed by the student, long-range planning, and factors about the team which might affect the success of a signing program (e.g., skill level of team members). The article also discussed designing a teaching program for sign language instruction for nonverbal hearing children including (but not limited to) sections on signing fluency of the teachers, the children's skill levels (motor, representational, etc.), vocabulary selection, and staff perspectives on language acquisition.

Though Kriegsman et al (1982) was not speaking directly to this MIMR population, it nonetheless answered some questions and proved helpful in the process of revising the ongoing sign language program and in some instances has served to reinforce the decisions that had already been made in the design process. For example, they discussed normal acquisition of sign language, concluding that signs are acquired by children in much the same way as verbal language. From this conclusion they surmise that "It would appear that sign programs based on English syntax can thus be structured in terms of normal language acquisition (p. 441)." This seems to give credence to the decision to follow the language development objectives obtained from published curriculum

guides for trainable mentally handicapped students, merely substituting signs for spoken words.

In a section of the paper on programming for signing, Kriegsman et al (1982) discussed one of the primary concerns of the project, how to insure that the students develop a productive language system, rather than merely acquire signs through rote learning. The article states that to be successful a sign language program should offer highly structured teaching tasks, teacher structured activities, and natural interactions with sign throughout the day; that providing concurrently for these will insure that acquisition, transfer, and generalization of signs will occur. In designing the program, an attempt had been made to provide these varied types of sign exposure to the students. Specific examples will be given below.

A list of vocabulary words was selected from established curriculum guides for moderately mentally retarded students. Particular attention was paid to the relevance these words had for the students, taking into account their home and school environments. Due to their developmental level the students in the project were able to work quite well with pictures, therefore this was the level at which the program began. However, it could be adapted for younger students quite easily by substituting actual objects in place of the pictures. A picture was collected for each of the vocabulary words and glued on one side of a note card. On the other side of each note card was glued a line-drawing representation of a person producing the sign for the vocabulary word. These drawings were photocopies reproduced from the Signed English dictionaries (Bornstein , H., Saulnier, K.L., & Hamilton, L.B., 1983; Bornstein et al, 1975) both of which are clearly and simply illustrated. These cards were kept in a file box and a Master List of the words was begun. Each student had a data collection sheet on which this list was also printed. It is very important that this Master List be kept current and also that any deviations from Signed English be duly noted on it. In

addition to the Master List, each student had a folder which contained the list of signs they knew, the intent being that this folder go with them throughout their school career so that communication could take place independent of specific staff persons. At an even later point, Master Dictionaries were created and added to these folders to be shared with other people who wished to communicate with the students (e.g., bus drivrs, scout leaders, etc.). All of this material was shared wih the students' families and they were encouraged to purchase a Signed English dictionary.

There are three types of teaching sessions in the program: training of new signs, practice/review of old signs, and assessment sessions. In each, the students may be involved either singly or in small groups. In training or practice sessions, the teacher presents the picture to the students and then produces the sign. They imitate the sign and the teacher helps to make corrections by physically manipulating their hands into the desired hand shape if necessary. The students have now become quite proficient at imitating the signs and only need physical assistance for those signs which require maximum dexterity such as "butterfly," "run," and "spider." The students have also become somewhat able to look at the line drawings of the signs in the Bornstein dictionary and produce them without the help of the teacher, a skill they acquired independently. They will do this during free time and then ask a staff person to supply the meaning of the sign they are copying. In fact, several of their free-time actvities involve the use of sign. These will be discussed elsewhere in the paper.

During <u>training,</u> responses are always recorded. Signs are marked in one of four ways: a plus (+) for an independently made correct sign, an (I) for a sign made in imitation of the teacher's sign, a (P) for a sign through which the teacher physically manipulated the student, and a zero (0) for no response or an incorrect response. Sometimes a (+/0) is given if the teacher is confident that

the student has the correct sign, but it is made much too sloppily to receive full credit. When assessing from the Master List only the (+) and (0) are used. Both receptive and expressive assessment is carried out because Goodman, Wilson, & Bornstein (1978) suggest that these areas should sometimes be taught as separate steps. Expressive assessing is done just as in the training session, the only difference being that of the data notation which was just described. For receptive assessing the teacher places two or more pictures on the table and asks the student to point to the one for which she has given the sign (e.g., teacher signs "show me ball" in the presence of a picture of a shoe and a picture of a ball). Receptive data is marked (+) or (0). Some sessions are devoted to improving articulation of signs, the teacher taking time to help the students refine their hand shapes and movements. Goodman, Wilson, & Bornstein (1978) express surprise that this step is not generally included in sign training. They make the point that articulation would be trained in a speech program and, since it is easier to do the necessary manipulations for articulation training of signs, they wonder if sign programs wouln't be more successful if this training were carried out. When the project began the vocabulary list consisted of 10 signs. The students have progressed such that currently two of them have Master Lists containing approximately 400 words. A word is taken off the training sheet and placed on a student's Master List after she has had 10 successive (+)'s. Students are periodically reassessed from their Master List and signs can reappear on a training list if they appear to have been forgotten. Particular attention is paid to expanding the students' vocabularies in meaningful and functional ways and input from family members and significant others is sought.

The students demonstrated no difficulty in developing a single-word vocabulary. The next task was to get them to begin connecting these words in short phrases (demonstrating expressive language) and to get them to respond to signed directions (demonstrating receptive language). Since they had made such

good progress so quickly with a structured approach, programming continued along those lines. A list was developed of two word phrases from which to collect data, and corresponding activities were developed. These activities are designed for categories of phrases. For example, one activity might revolve around the use of the sign "want" in conjunction with other noun signs. Teacher and student take turns asking each other for one of several items placed on the table. One session might include a glass of juice, some raisins, carrot sticks, and peanuts. In order to get one of the items, the teacher or student would have to use one of the two-word phrases (want drink, want raisin, want peanut, want carrot). Another session might revolve around use of a two-word phrase involving a modifier (e.g., color/object, size/object, number/object). Data for these sessions would involve recording the student's sign production ("red ball," "big car," "three pencils").

One problem that came up when attempting to get the students to use two-word phrases involving people's names was- how do you sign a person's name? We mention this here because if you are not a fluent signer (as we were not), you would not know how to do this. Fingerspelling everyone's name is not only cumbersome but also very difficult for the HIMR student. A little research was necessary to solve this problem, but the answer was found in Wilbur (1976). To make a name sign, first make the handshape for the first letter of a person's name (the letter "a" for Anne). Second, choose a location and/or a movement for that handshape which would have meaning for that person. For example, a woman with curly hair whose name is Dorothy might make the sign for "curl" with the letter "D", or a man named Kevin who had dimples might make the sign for "dimple", but with the letter "K". In this way, name signs were designed for each student and staff member in the classroom. Now, every person who comes into contact with the students on a regular basis is asked to develop a name sign. One-time visitors have their names fingerspelled and written on the blackboard

simultaneously. A record of name signs is kept to avoid duplication. Shortly after we had assigned name signs to everyone in the room, one of the students began creating them for her family members. We discovered this during a conference when her parents asked why she was "doing this" (making the sign for "pop") whenever she wanted her father's attention; the other children in the family called him Papa.

In a logical manner, activities were later designed to move the students through longer phrases. Three-word phrases include "I want" followed by a noun, "Give me (noun)", and double-adjective/noun phrases ("big red ball, little yellow car) and were taught using similar structured activities . One of the students is now very proficient at the longer phrases, producing ones of four to five words with no difficulty ("I want go room," "two girls play game outside"). Whenever moving to a new phrase length the students seem to first use the signs in a rote and programmed manner. However, through much modeling and with much practice, they soon begin to generalize and transfer the skills, demonstrating spontaneous and appropriate use of the phrases. For example, the first use of "I want" was used to obtain desired objects, but it was not until the students began to use variations spontaneously ("you want," "Chris want") and responding to directions containing the concepts of "I/you/me" and "want" that we considered that language learning had taken place.

Even as students progress through the structured sign language activities and develop a vocabulary of useful signs, it is often difficult to get them to use the signs spontaneously (i.e., conversationally) either with staff members or their peers. One activity which is useful in developing signing among the students involves the use of magazine pictures. Whenever a staff member finds a picture of a word (sign) in the students' vocabulary, it is cut out of the magazine. The picture is then put into a large plastic tub which has become known as "the sign box" (so named by the students). As an independent activity,

then, students who are on the sign program are given the box and encouraged to sign the pictures with each other. They take turns playing "teacher" and often include their hearing peers. This has become a favorite leisure-time activity and has been correlated with an increase in conversational sign in the classroom. As a bonus, it gives the students extra practice time at signing.

One of the major goals of any structured language/communication program is to help the student develop the ability to follow directions. This is particularly true with the HIMR student. The sign language becomes a true communication system if the student uses it to give or receive (follow) directions. The two-way street is established and true communication has taken place. One major stumbling block in teaching direction-following skills to HIMR students has been in the area of preposition use. HIMR students appear to have a difficult time developing prepositional concepts. Because they have significant hearing losses and their families have not learned to sign with them from a very young age, they have been denied an opportunity which every parent gives to his nonhandicapped children, that is, the labeling of actions and objects through conversation. How many times does a parent use prepositions with a child when playing with her? Even with infants, most parents are chattering constantly: put the diaper <u>on,</u> take your bootie <u>off,</u> here's your teddie <u>next</u> to you, etc. Due to the difficulty the students displayed, it was deemed necessary to establish a method of teaching prepositions in a very organized and systematic manner.

A list of beginning prepositions was devised by choosing prepositions that appear to be the earliest emerging developmentally from several established curricula for mentally retarded students. These are "in, on, under," followed later by "in front of, behind, and beside." Activities were developed to enable the students to demonstrate both a receptive and expressive understanding and included physical movement of the students themselves, use of objects, and use of pictures. Sample activities can be found in the appendix to this paper.

The last major component of the program is the attempt to get other persons who are in frequent contact with the students to learn the sign system, especially family members and other staff members in the school. Without question, achieving this goal has been the most difficult of all. Six years after the program's implementation, there are no fluent signers among these two groups and few have learned enough to be conversant with the students. Motivating family and staff members is definitely an area needing further work. Let me outline what we have tried; suggestions are more than welcome.

Over the course of the school year workshops are held to familiarize the school staff (teachers, aides, ancillary staff, adminstrators, etc.) with the sign language system being used in the classroom. The response to these workshops is always generally positive. However, there is not much long-term interest generated in learning to use Signed English. Another intervention method has been an attempt to hold small weekly classes in Signed English. Classroom staff ran the classes and supplied all the materials necessary for anyone who wished to attend. Once again, the classes were very popular, but there appeared to be no concomitant increase in the use of sign by the staff when interacting with hearing handicapped students. Currently, there is no ongoing training program for other school staff, but materials are provided to all who request them. For example, dictionaries (photocopies of the Master Dictionary) have been supplied to bus drivers, cafeteria workers, and scout leaders who come in contact with the signing students, and sign cards are routinely pulled from the file box in response to teachers' requests for specific signs.

Family members of the students in the project have proven to be particularly difficult to motivate to learn Signed English, though part of the problem here lies in some logistical difficulties. Parents are unable to come to school during the day to attend sign classes and it is unreasonable to expect teaching staff to give up time outside of school hours to offer the classes. However,

information about relatively inexpensive (sometimes even free) sign classes which are offered through several local school districts' adult education programs is routinely sent home to the parents. Since the level of proficiency attained by one semester's instruction in sign language would be sufficient for communicating with our students at their current level, it is especially sad that so far no one has bothered to travel this route. Most families, however, did order their own copies of the Signed English Dictionary (Bornstein et al, 1975) through a mass ordering coordinated by the classroom staff. It is hoped that these dictionaries are kept available in the homes and that they may have aided the families in communicating with their children. Additonal encouragement to learn Signed English is given to the families at each parent/teacher conference or IEP meeting and hope springs eternal that someone will actually enroll in a class at some point as this seems the most efficient method for learning the system.

As supplements to the dictionaries, parents are regularly supplied with materials relevant to current classroom or home activities. For example, before each major holiday posters are sent home with the students which depict the relevant signs for that holiday. The students are involved in making the posters as a training or review session for the signs in order to encourage them to demonstrate the signs to their parents and siblings. There is a direct attempt to make the posters as attractive as possible so that the families will want to display them prominently in the home. For instance, at Christmas the students cut out large green wreaths from construction paper around which they glued photocopies of the signs for such things as Christmas tree, ornament, present, candy cane bell, star, etc. The wreath was then decorated with red cut-out holly berries and a large bow before being sent home.

We continually try to stress to the families that establishing a communication system with their HIMR family member is very rewarding, often discussing with them how communication can itself be a motivating factor in other

areas of family life. One good example occurred when one of the parents requested help in getting her daughter to perform activities at home which she was currently not performing. The mother realized that her daughter could perform these tasks as she consistently passed the objectives for them at school. Our intent was to fulfill the mother's request while simultaneously encouraging the use of sign in the home. Therefore, a communication notebook was begun by placing pages of construction paper in a three-ring binder. On each page an instruction was printed (e.g., wash the dishes) and photocopies of the appropriate signs were glued to the page (e.g., line drawings of the signs for wash and dish) along with a picture of someone performing the desired activity (an advertisment from a magazine showing a girl washing the dishes). The student practiced signing the instruction from each page with the teacher before taking the book home to her mother. The mother had been instructed to show the appropriate page to her daughter when she wanted the desired activity to take place. The teaching staff had modeled the corresponding signed instructions for each page for the mother and she had been told to sign the appropriate instruction and show the corresponding page to her daughter when she wanted a task performed. The family reported great success with the notebook; in fact they were quite surprised at the outcome - Lisa did the dinner dishes the first night the notebook went home and duly reported this to us the very next day.

In summary, the project has been in operation now for about 6 years and can be judged successful against the objectives to teach the students to use Signed English for communication purposes. A less successful aspect of the program has been the component involving the learning of the sign system by family members and staff persons outside of the students' classroom base. Work continues in this area. What has been learned from this experience? Signed English appears to be an appropriate system choice for HIMR students. The students demonstrated learning within a structured, data-based approach. Students who are both hearing

handicapped and mentally retarded can develop a functional communication system involving the use of sign language. Since there is very little research in this area, it seems that practitioners are going forward and developing teaching programs out of necessity without the research programs upon which to base their decisions. Much work needs to be done. Many questions still need to be answered. Systematic studies of the efficacy of the techniques and program choices described in this paper are badly needed. However, in the absence of more thorough studies, this area provides an opportunity for teachers to fully exploit a scientist/practitioner model of their profession.

APPENDIX

Sample Teaching Activities

Activity 1: Sentence Generation

Materials: blackboard and colored chalk or chartboard and colored markers

The teacher picks a concept around which to center the activity. The concept should be one which the students have already mastered or it will prevent them from concentrating on the actual generation of sentences. One concept might be gender identification. The teacher begins by saying "(Her name) is a woman" while signing "(Her name sign) is woman." Woman is used if the students understand the concepts of girl/woman, boy/man. Otherwise the teacher would use girl for herself as well as for her female students. She then writes the words "(Her name) is woman" on the blackboard or chartboard. Each word is written in a different color (e.g., name is written in black, "is" in red, and "woman" in purple. Each student then has a turn to generate an appropriate sentence and the sentence is written on the board, keeping the color coding consistent with all of the sentences. The teacher may need to model more than once at the beginning of this activity. Students then take turns signing the sentences which have been written on the board, using the color coded written words as prompts. Though the students on the project are nonreaders they can all read each others' printed names and appear to use the colored words as visual cues to order their signs correctly. Other activites might be based on concepts such as name ("my name is..."), emotions ("I am happy/sad/mad,etc."), age, etc. A third sentence-generating activity in the project revolves around describing pictures of people involved in an activity. The teacher holds up a picture and helps the students to generate a simple sentence (e.g., "Girl washes dishes") and later, as

the students progress, even more complex sentences (e.g., "Two boys play ball", "Boy and girl put garbage in can"). At this level the students will be generating and signing modifiers, but will probably still not be using words such as "the".

Activity 2: Use of prepositions, physical movement

Materials: equipment and furniture readily available in the classroom

Students should be seated on the floor or in chairs from which they can move about easily. The teacher sits on the floor or a low stool so that students can clearly see her signs and she should be wearing the microphone for any students using Phonic Ears or similar equipment. She should give commands and signs clearly. Keep them simple, do not clutter the directions with unnecessary signs as they are distracting and confusing. When first beginning the activity the teacher can demonstrate commands or she can incorporate one or more hearing students in the group to be demonstrators. The teacher gives the verbal commands and signs simultaneously, remembering to reward appropriately correct responses. For an incorrect response the teacher signs and says "no" and "wrong" and helps the student through the correct response. Sample commands:

Verbal	Sign
1) sit on the chair	1) sit on chair
2) stand in front of me	2) stand front me
3) go under the table	3) go under table
4) sit beside (name)	4) sit beside (name)
5) stand in the box	5) stand in box
6) sit behind (name)	6) sit behind (name)

It is not advisable to move on to objects or pictures if the student is not successful at this level. The teacher may also devise games involving these directions if the students stay at this level for a while and a variety of activities is needed to prevent boredom. We used large packing boxes in which some furniture had arrived.

Activity 3: Use of prepositions, object manipulation

Materials: one-inch cubes, large mug with handle and decal on front (one per student)

The teacher gives each student his mug (sign "cup") and a one-inch cube (sign "block"). She then gives the directions to the students (she may give them all the same direction or each a different one in turn). Sample directions:

Verbal	Signed
1) put the block in the cup	1) put block in cup
2) put the block on the cup	2) put block on cup
3) put the block beside the cup	3) put block beside cup
4) put the block in front of the cup	4) put block front cup
5) put the block behind the cup	5) put block behind cup
6) put the block under the cup	6) put block under cup

"On" and "under" the cup are performed by inverting the mug. Since you are teaching "in front" and "behind" it is important that the stationary object have a definite front and back (e.g., the mug has a decal on the front). Once the students are comfortable with this set of directions, the teacher may also add

"put the block over the cup" and demonstrate by holding the block above but not touching the mug.

Activity 4: Use of prepositions, signed response to pictures

Materials: prepositions cards (ordered from any educational materials supply house, or make your own), blackboard or large chart paper, colored chalk or markers

The teacher tapes up a picture and helps the students to generate a sentence for the picture. For example, "the bird is above the cage". Write the simplified sentence on the board or chart paper (bird is in cage). When writing the words use a different color for each word and be consistent by word order (i.e., all subject words will be black, verbs red, prepositions green, and objects blue). The students then each independently sign the sentence following the color-coded sentence. As long as the words are in the student's sign vocabulary, she should not have difficulty with this method, even if she is a nonreader. The students very soon realize that they need one sign per word unit and begin to connect the colors with word classes which makes even their mistakes more appropriate. This activity is also useful for developing the subject-verb-object word order in sentences. As the students become more proficient, the teacher withdraws the additional visual cues and requires the students to generate correct word order responses to the picture alone.

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